

Presentation to NIST VCAT

Linda Capuano, Chair
Board on Assessment of NIST Programs
September 9, 2003

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Outline

- Description of assessment
- Overall findings for NIST Laboratories
- Summary

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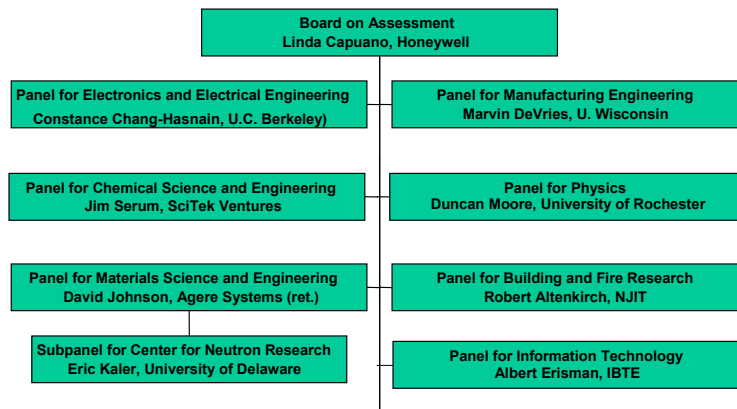
Charge to the Board

- Assess Laboratory Programs
 - Technical Merit
 - Effectiveness of execution and dissemination
 - Relevance to customer needs
 - Adequacy of facilities, equipment, and human resources

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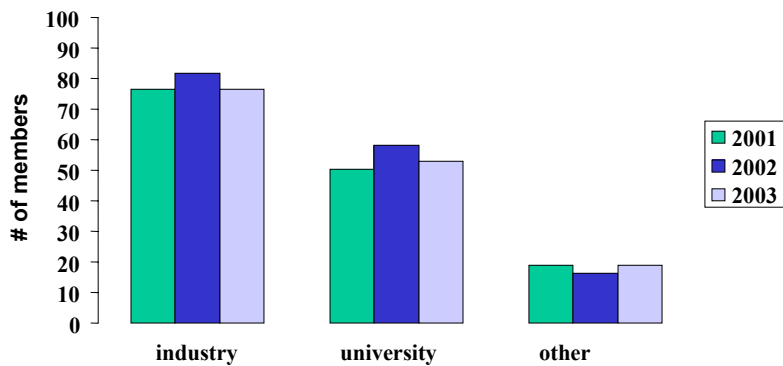
Organization of Board and Panels



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Participants by Sector



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Diversity of Participants (FY 2003 Assessment)

- 28% of panelists were new (the remainder were continuing members)
- 85% of panelists have Ph.D.'s
- 17% of panelists are women or minorities
- 17% of panelists are members of the National Academy of Sciences or National Academy of Engineering

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Outline of Process

- December: Board met, new member orientation
- Jan./Feb.: Divisional subpanels visited labs (1½ days)
- Feb./Mar.: Laboratory panels met at NIST (1½ days)
- May: Board received panel reports, met with OU heads, drafted overview (1½ days)
- September: Pre-pub report to NIST
- Early October: Final report delivered

Improvements in Process

- Board has continued to use best practices exercises to develop a more uniform, improved process and report; some examples:
 - defining and disseminating themes for assessment in December
 - panel vice-chairs for smooth leadership transitions
 - skip-level sessions at panel meetings
 - annual feedback sessions with lab directors
 - ad hoc cross-cut panels to assess programs that cross NIST organizational units

Planned Process Improvements

- Biennial reporting
 - NRC reports to be issued only in odd years, based on two years of observations
 - Annual site visits/panel meetings will continue
 - Result is greater emphasis on peer-to-peer interactions, lessened emphasis on report writing

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Planned Improvements (cont.)

- Panels will clarify their data needs to reduce amount of preparation by NIST
- Longer panel meetings (in lieu of pre-visits) will expose members to multiple divisions, enabling greater insight into the Laboratories
- Panels will digest their observations and discuss concerns on the spot with OU leadership

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2003 Assessment

- Technical Merit
- Relevance and Effectiveness
- Resources

Technical Merit

- Technical quality of the on-going work remains high
- Very good to excellent:
 - the level of technical skill and knowledge, applied as required to the problems addressed
 - the degree of excellence and creativity in the investigative approach

Technical Merit: Examples

- EEEL: “electronic kilogram”
- MEL: nanotechnology for manufacturing
- CSTL: microfluidics control and analysis
- Physics Lab: time and frequency technologies
- MSEL: lead-free solder
- BFRL: fire dynamics simulator
- ITL: update of *Handbook of Special Functions*

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Relevance and Effectiveness

- Generally a continued good balance between research and services
- Programs generally well aligned with NIST’s goals and mission
- Laboratory strategic planning efforts continue to span a spectrum of quality and effectiveness – with generally good progress in this area

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Relevance and Effectiveness

- Programs generally aligned with needs of the currently identified customer base
 - Customer satisfaction is measured
 - Significant proactive involvement with standards bodies, industry groups, technical meetings, workshops
 - Impressive amount of access to NIST Web sites
- Challenge of balancing good customer relations with pursuit of new areas of involvement

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Relevance and Effectiveness

- Flexibility to react to unanticipated needs (homeland security is an example):
 - DNA forensics tools for WTC identification
 - Evaluating structural weaknesses for WTC investigation
 - Imaging technologies for noninvasive imaging of weapons
 - Communications expertise addressing emergency response needs
 - Use of simulation to predict anthrax flow through Hart Senate Office Building
 - Verification of mail decontamination protocol through radiation dosimetry
 - Cybersecurity of industrial control systems

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Resources

- Strong staff remains the key resource
- Flat budgets are eroding staffing levels
- Significant retirements can be anticipated in next 5-10 years
 - Planning now for these retirements is crucial
 - Need to capture key experience—mentoring program

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Resources

- Challenge of maintaining balance between:
 - Regular and temporary employees (to insure continuance of knowledge base)
 - Administrative support and technical staff (to maximize technical productivity)
 - Professional staff and laboratory technicians (to maintain cost-effective distribution of assignments)
 - Service and research activities (to fulfill standards mission and remain at research forefront)

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Resources

- Equipment overall adequate
- Situation mixed
 - Some outstanding, unique equipment (e.g., some manufacturing metrology capabilities, time and frequency laboratories, chemistry facilities)
 - Some units experiencing space constraints that could hamper efficiency of work (e.g., JILA and EEEL facilities at Boulder, BFRL fire testing facility)
 - Some funding now slated for Boulder improvements
- Budget shortfalls for AML move and for post-move operations

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Resources: Planning

- Generally good progress in strategic planning
 - Overall NIST Strategic Plan (“NIST 2020 Plan”) gives good guidance
 - Strategic Focus Areas are effective at directing and coordinating efforts across the Laboratories
 - Strategic plans are influencing programmatic decisions
 - Apparent broad understanding of the plan
- Useful operating plans that are tied to the strategic plan exist in some Laboratories and are emerging in others

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Resources: Planning

- Strategic planning still not mature enough to significantly influence resource planning
- Many cross-laboratory collaborations at the bench level; need more collaborative planning at higher levels
- Need for regular attention to changing priorities and opportunities – and to determine when to stop good work in order to do other good (or better) work

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Summary

- Overall technical merit remains high
- Breadth and depth of talent allows flexible response to known and unanticipated needs
- Programs generally well aligned with NIST's goals and mission and with needs of identified customers

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Summary, cont'd

- Laboratory strategic planning efforts continue to span a spectrum of quality and effectiveness – with generally good progress in this area
- Better resource planning, tied to strategic plan, is still needed.
- SFAs are a solid basis for program selection and management.

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Summary, cont'd.

- Need succession plans to maintain skills and knowledge as employees retire
- Facilities resources generally adequate, and outstanding in several cases
- Some space constraints may inhibit work
- AML budget shortfalls worrisome

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